Water Contamination

Impact Scenarios

Earth & Environmental Sciences

Los Alamos NATIONAL LABORATORY EST.1943

We are developing a model to understand and quantify the consequences of a disruption to our potable water distribution system and its possible impacts on other critical infrastructures that may result from a waterborne contaminant.

Left: *Flooding and water contamination in the aftermath of Hurricane Katrina.*

Inset: *Water dog, Pfc. Christopher M. Bullard, 20, from Purcell, OK, performs one of his three daily water-quality tests in a shower tent in eastern Afghanistan.*

Background

The USA's potable water distribution systems provide the greatest targets for terrorists seeking to disrupt our water infrastructure. A successful attack could cause widespread panic, severe economic impact, and a loss of public confidence in water supply systems. Emergency response decision makers need a tool for quickly calculating resource requirements in the aftermath of a contamination incident. A model is needed to describe the potable water distribution system itself and the cascading effects of its disruption on other public institutions such as hospitals, transportation networks, etc.

Capabilities

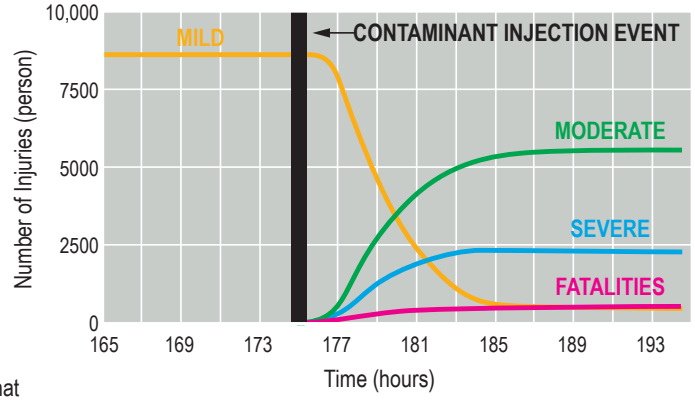
In support of the Critical Infrastructure-Decision Support System (CIP-DSS) project we developed a model for a generic potable water distribution system which services an urban area. The main goal of this work was to model a possible scenario where a contaminant is introduced in the potable water distribution system. This model, developed in system dynamics, is coupled to other critical infrastructures developed in the CIP-DSS metropolitan model. The results allow us to estimate the economic and public health consequences of a disruption in water quality and supply.

Future Applications

We are looking to integrate this system dynamics model with a GIS (Geographic Information System) interface that will allow us to use specific urban and geographic topologies.

Contact

Donatella Pasqualini
MS D452
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545 USA
505 667 0701
dondy@lanl.gov



Right: The severity of the illness in response to a contamination event indicates that about 64% percent of the population would suffer moderate illness, 26% would become severely ill, 5% of the population would be moderately ill and 5% would die.